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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,001	03/27/2001	Nicholas A. Kotov	67183 /01-188	2021

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FELLERS SNIDER BLANKENSHIP
BAILEY & TIPPENS
THE KENNEDY BUILDING
321 SOUTH BOSTON SUITE 800
TULSA, OK 74103-3318

EXAMINER

LEE, EDMUND H

ART UNIT PAPER NUMBER

1732

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/818,001

Applicant(s)

KOTOV, NICHOLAS A.

Examiner

EDMUND H. LEE

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-26 is/are pending in the application.
- 4a) Of the above claim(s) 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16, 18-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. Claim 17 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/5/04.
2. Applicant's election without traverse of claims 12-16 and 18-26 in the reply filed on 8/5/04 is acknowledged.
3. Claims 12-16 and 18-26 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for immersing the substrate in a first solution or dispersion of a first substance and a second solution or dispersion of a second substance, does not reasonably provide enablement for applying to the substrate a first solution or dispersion of a first substance and a second solution or dispersion of a second substance (claim 12). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The instant specification only discloses immersing the substrate to apply the solutions or dispersions. A step of applying is broad enough to include methods other than immersion to apply the solutions or dispersions, e.g., spray coating, molding, spin coating, etc. Methods of applying other than immersion is not supported by the instant specification.

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12-16 and 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (USPN 6391220) in view of the admitted prior art set forth on pg 2, ln 1-pg 3, ln 7. In regard to claim 12, Zhang et al teach the basic claimed process including a method for the assembly of a layer-by-layer thin film (col 4,ln 57-col 5, ln 6; figs 1-5); applying a release layer/substrate to a support surface/substrate (col 2, lns 40-45; col 4,ln 57-col 5, ln 6; figs 1-5)--as a note, it should be mentioned that the release layer and substrate of Zhang et al constitute the claimed substrate and support surface, respectively; forming a layer-by-layer thin film upon the release layer by any suitable process such as electroplating (col 4,ln 57-col 5, ln 6; figs 1-5); removing the release layer together with the thin film from the substrate (col 4,ln 57-col 5, ln 6; figs 1-5); and separating the release layer from the thin film (col 4,ln 57-col 5, ln 6; figs 1-5). Zhang et al also teach separating the release layer/substrate from the thin film without disturbing the integrity of the thin film (col 5, lns 46-55). However, Zhang et al does not teach forming each layer to have an average thickness of less than 100 nm; and forming the claimed thin film by the claimed substeps. The admitted prior art teaches it is well-known in the thin film technology to form thin films by the layer-by-layer (LBL) assembly method, wherein the each layer has an average thickness of 1-100 nm. The admitted prior art teaches that LBL comprising depositing a film on a substrate by

repeating the process of: 1) immersion of the substrate in an aqueous solution of polyelectrolyte; 2) washing with neat solvent; 3) immersion in an aqueous solution of nanoparticles; and 4) final washing with neat solvent. This process can be repeated as many times as necessary depending on the number of layers required. Further, the admitted prior art teaches that LBL is an attractive alternative to other thin film deposition techniques because it is simple and universal. Zhang et al and the admitted prior art are combinable because they are analogous with respect to forming a thin film assembly. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the LBL method of the admitted prior art as the deposition process of Zhang et al in order to reduce process complexity. It should be mentioned that the separating methods of Zhang et al are the same as the instant invention thus the combined teachings of Zhang et al and the admitted prior art teaches the claimed limitation of overcoming the affinity between the first layer of the first substance and the substrate while retaining the affinity between the first substance and the second substance in the additional layers. In regard to claim 13, such is taught by Zhang et al (col 2, lns 40-45; col 4, ln 57-col 5, ln 6; figs 1-5)--as a note, it should be mentioned that the release layer and substrate of Zhang et al constitute the claimed substrate and support surface, respectively. In regard to claim 14, such is taught by Zhang et al (col 2, lns 40-45; col 4, ln 57-col 5, ln 6; figs 1-5). In regard to claim 15, such is taught by the above combined teachings of Zhang et al and the admitted prior art. In regard to claim 16, such is taught by Zhang et al (col 5, lns 46-55). In regard to claim 18, such is taught by Zhang et al (col 5, lns 46-55). In regard to claim 19, such is

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mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to build up layers of different material. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a third substance having an affinity similar to the first substance in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 20, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to build up layers of different material. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a third substance having an affinity similar to the first substance in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 21, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, it is well-known in the thin film art to use a biological compound as a component of a layer. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biological compound as one of the substances used in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 22, such is mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the

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claimed process. Further, it is well-known in the thin film art to use a biological compound as a component of a layer. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biological compound as one of the substances used in the process of Zhang et al (modified) in order to produce diverse thin films. In regard to claim 23, Zhang et al teaches building up layers of the thin film (col 4,ln 57-col 5, ln 6; figs 1-5)--as a note, each layer constitutes a layer of material that structurally stabilizes the thin film. Zhang et al, however, do not teach using the claimed stabilizing material. The use of the specific material is a mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, the claimed material are well-known in the molding art for their strength. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed material in the process of Zhang et al in order to increase the strength of the layers. In regard to claim 24, Zhang et al teaches building up layers of the thin film (col 4,ln 57-col 5, ln 6; figs 1-5)--as a note, each layer constitutes a layer of material that structurally stabilizes the thin film. Zhang et al, however, do not teach using the claimed stabilizing material. The use of the specific material is a mere obvious matter of choice dependent on the desired final product and of little patentable consequence to the claimed process since it is not a manipulative feature or step of the claimed process. Further, the claimed material are well-known in the molding art for their strength. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the claimed material in the

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process of Zhang et al in order to increase the strength of the layers. In regard to claim 25, the claimed methods of cross-linking are well-known in the molding art. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any one of the claimed methods to cross-link the layers of Zhang et al in order to effectively harden the layers of Zhang et al. In regard to claim 26, such is taught by the above combined teachings of Zhang et al and the admitted prior art.

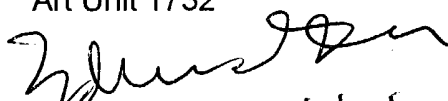
6. Applicant's arguments with respect to claims 12-16 and 18-26 have been considered but are moot in view of the new ground(s) of rejection.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDMUND H. LEE whose telephone number is 571.272.1204. The examiner can normally be reached on MONDAY-THURSDAY FROM 9AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on 571.272.1196. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

EDMUND H. LEE
Primary Examiner
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10/1/04

EHL